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Percent Solids SOP

Access to this SOP shall be available within the laboratory for reference purposes; the official copy of this SOP resides on the official Georgia EPD website at https://epd.georgia.gov/about-us/epd-laboratory-operations. Printed copies of this SOP will contain a watermark indicating the copy is an uncontrolled copy.

1 Scope and Application

1.1 This method is applicable to the determination of total solids and its fixed and volatile fractions in such solid and semisolid samples as river and lake sediments, sludge separated from water and wastewater treatment processes, and sludge cakes from vacuum filtration, centrifugation, or other sludge dewatering processes.

2 Definitions

2.1 Refer to Chapter 3 of the Georgia EPD Laboratory Quality Assurance Manual for Quality Control Definitions

3 Interferences

3.1 The determination of both total and volatile solids in these materials is subject to negative error due to loss of ammonium carbonate and volatile organic matter during drying.

3.2 Make all weightings quickly because wet samples tend to lose weight by evaporation. After drying or ignition, residues often are very hygroscopic and rapidly absorb moisture from the air.

4 Safety

4.1 Refer to Laboratory Chemical Hygiene Plan, online revision

5 Apparatus

5.1 Evaporating dishes: 25g capacity

5.2 Dessicator, provided with a desiccant containing a color indicator of moisture concentration or an instrumental indicator.

5.3 Drying oven, for operation at 103 to 105ºC

5.4 Analytical balance, capable of weighing 0.01g

6 Reagents

6.1 Not applicable

7 Sample Collection

7.1 Refer to Chapter 5 of the Georgia EPD Laboratory Quality Assurance Manual for Sample Container, Sample Preservation, and Sample Holding Times.

8 Calibration

8.1 Calibration Standards - Not applicable.
8.2 Calibration Curve - Not applicable.
8.3 Calibration Verification - Not applicable.
8.4 Calibration of Balance
8.4.1 See Balance Use, Maintenance, and Training, SOP 7-10 for proper calibration and use of an analytical balance.

9 Quality Control

9.1 Refer to Table13.1 for Reporting Limits (RLs), Table 13.2 for Quality Control Acceptance Criteria, and Table 13.3 for Quality Control Procedures associated with this method.
9.2 Temperature of oven 103-105ºC

10 Procedures

10.1 Preparation of evaporating dish – If total solids are to be measured, heat dish at 103 to 105ºC for 1 hr in a hot air oven. Cool in dessicator, weigh and store in dessicator until ready to use.
10.2 Fluid samples – If the sample contains enough moisture to flow more or less rapidly, stir to homogenize, place 5 to 10g in a prepared evaporating dish, and weigh. Evaporate to dryness at 103 to 105ºC for 1 hr in a hot air oven, cool to ambient temperature in an individual dessicator containing fresh desiccant, and weigh. Repeat heating, cooling, desiccating, and weighing procedure until the weight change is less than 4% or 50mg, whichever is less.
10.3 Solid samples – Place 5 to 10g in a prepared evaporating dish and weigh. Place in a hot air oven at 103 to 105ºC overnight. Cool to ambient temperature in a desiccator and weigh. Repeat drying (1hr), cooling, weighing, and desiccating steps until weight change is less than 4% or 50mg, whichever is less. Duplicate determinations should agree within 5% of their average.

11 Calculations

$$\%\text{Total solids (dry weight)} = \frac{(A-B)}{C-B} X100$$

Where:
A=weight of dried residue + dish, grams
B=weight of dish, grams
C=weight of wet sample + dish, grams
D=weight of residue + dish after ignition, grams

12 References

12.1 Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846) Third Edition.

13 Method Reference Tables

Table 13.1 RLs for %Solids

Parameter/Method	Analyte	Matrix(XXXX)	
		RL	Unit
SW846-3541/5035	%Solids	0.10	%

Table 13.2 Acceptance Criteria for %Solids

Method	Analyte	Accuracy Water (%)	Precision Water (%RPD)
SW846-3541/5035	%Solids	NA	<5%

Table 13.3 Summary of Calibration and QC Procedures for Method %Solids

Method	Applicable Parameter	QC Check	Minimum Frequency	Acceptance Criteria	Corrective Action	Flagging Criteria
SW846-3541/5035	%Solids	Oven temp.	Per Analysis	103-105ºC	Adjust temp.	N/A
SW846-3541/5035	%Solids		Per Analysis	<4% or 50mg	Reweigh	